DOCUMENT RESUME

ED 217 842 IR 010 200

AUTHOR Corbin, John, Ed.
TITLE Proceedings of the Preconference on Online Catalogs (Houston, Texas, March 31, 1981).
INSTITUTION Texas Library Association.
PUB DATE Mar 82
NOTE 79p.

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Academic Libraries; *Card Catalogs; Cataloging; Computers; *Costs; *Databases; Higher Education; Information Retrieval; Librarians; Library Services; *Online Systems; Reference Services
IDENTIFIERS Austin State University TX; Library Users; Northwestern University IL

ABSTRACT

The four papers in this collection discuss the planning, development, and use of online library catalogs. The first article on the requirements for online catalogs by Velma Veneziano describes such specific features as comprehensiveness, flexibility, affordability, availability, structured access, user friendliness, level of cataloging, and status information on holdings. The development of online cataloging is then discussed by R. Bruce Miller in his paper on planning, creating, and maintaining the bibliographic database. This is followed by Elizabeth Wallace's article on selling and explaining the online catalog to a user community, which includes a description of survey findings on the use of online catalogs by library staff, faculty, and students and a reference list. Richard Woods' presentation on the costs of online library catalogs identifies such costs as software and hardware components and discusses computer facilities management and the feasibility of implementing an online catalog. (RBF)

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ED217842

PROCEEDINGS OF THE PRECONFERENCE

ON ONLINE CATALOGS

Held March 31, 1981

in Houston, Texas

Sponsored By

College and University Libraries Division

of the

Texas Library Association

Edited by John Corbin

Texas Library Association
Houston, Texas
March 1982

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PREFACE

The days of library catalogs in card form seem numbered, due to their size, cost, and other limitations which will restrict their usefulness in most libraries of the 1980's and 1990's. Many libraries have already moved to online catalogs, either as a supplement to their card catalogs or as their complete replacement.

The objective of this conference, held March 31, 1981, in Houston as a pre-conference to the annual conference of the Texas Library Association, was to provide information about online library catalogs and their planning, development, and use. The conference was presented by the College and University Libraries Division (CULD) of the Texas Library Association. All papers, except one, presented at the meeting are reproduced in this publication. The paper of Jean Hamrick, "Hardware and Software to Support Online Library Catalogs," was not made available for publication.

Houston
January 16, 1982

WELCOME

John Corbin

Good morning. On behalf of the College and University Libraries Division of the Texas Library Association, I would like to welcome you to this conference on Online Library Catalogs. My name is John Corbin. I will serve as manager for the day's activities. For your information, 194 of you pre-registered for this conference, including 101 academic librarians, 38 public librarians, 20 school librarians, 18 special librarians, and 17 of you who come from miscellaneous types of organizations or did not identify your library. We have three out-of-state registrants: two from Oklahoma and one from Iowa.

Our objective in mounting this conference is to provide you with specific information pertaining to five aspects of online catalogs: their requirements, hardware and software, the bibliographic data base, public relations, and costs. For the moment, we are defining an online catalog as "a bibliographic catalog or index to all or a part of the holdings of a library, maintained on magnetic disk or similar mass storage by a computer and made available to library users at remote terminals, in an interactive mode." Any of our speakers--or any of you in the audience--are invited to improve on this as the day progresses. We wanted to hold this conference at this time because many libraries are on the brink of initiating online catalog programs or have them well underway already. Some already have online catalogs in place.

John Corbin was Associate Librarian for Technical Services, Stephen F. Austin State University, Nacogdoches, Texas, at the time of this conference. He now is Assistant Director for Administration and Systems, University of Houston Central Campus, Houston, Texas.

The results of a survey of online catalogs in Texas, conducted by the Education Committee of CULD, was included in your packets.

There seem to be three basic reasons why librarians are moving towards online catalogs:

1. The computer is proving itself to be a better storer, retriever, and disseminator of complex bibliographic data and index files than we humans are.

2. The computer can store, update, retrieve, and disseminate this data much faster than we can.

3. The time is fast approaching, if it is not here already, when the computer and other machines can store, retrieve, and disseminate the information less expensively than humans can.

Let me hasten to say that I am certainly not predicting the end of the library profession. Far from it. There are still myriad things that humans can do better than machines. The computer is a marvelous tool that must be viewed just as that--as a tool to assist librarians in providing more timely, more accurate, and more complete information than ever before. The librarian and the computer are rapidly becoming symbiotic partners in the provision of information services to our respective user communities. We are entering the decade when that partnership will blossom fully for many libraries.

Having conquered the automated circulation system and OCLC, many of you now are looking down the road to the online catalog. Today, we have five presentations by librarians who either manage on-going online catalogs or design them. The pattern for the day will be the same for all five: each will give her or his presentation, followed by questions from the audience. We also will give you an opportunity after all the presentations for additional questions.

REQUIREMENTS FOR ONLINE CATALOGS

Velma Veneziano

Earlier this year when John Corbin first approached me about speaking at this preconference, he sent along a one paragraph definition of an online catalog. I read it, and reported back to John that it looked quite reasonable. But the other day when I started preparing this talk, I re-read it and something about it disturbed me. He had described an online catalog as "a bibliographic catalog or index." I got to thinking--I couldn't recall ever having heard a librarian refer to our card catalog as an index. Were the terms synonymous? Or were we in fact beginning to change our idea of a catalog?

It occurred to me that perhaps our concept of a catalog was being altered because, increasingly over the last few years, we were beginning to rely on commercially available online indexing and abstracting data bases. The question: was there a difference between an index and a catalog?

Webster defines an index as a "guide," "something that serves as a pointer or indicator." A catalog, on the other hand, is defined as a "list" or a "register;" "a complete enumeration of items arranged systematically with descriptive details." The operative word, to my mind, is "systematically." My interpretation is that a catalog is an index, but an index is not necessarily a catalog.

Is this a distinction without a difference? Will the end user of the online catalog be served equally well if we de-emphasize the

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systematic character of the catalog?

If I have dwelled somewhat on the semantics involved, it is because I am concerned that, in our haste to provide our users with online access to catalog data, we may discover that we are using inappropriate techniques, techniques which, although they have a surface flashiness, may prove to be weaker than the system they replace.

Therefore what I want to focus on today is not only those features which an online catalog should have, but on those features which are only marginally beneficial, features which may hinder rather than help in achieving the objective of providing the maximum level of bibliographic access at a minimum cost. If I keep coming back to cost, keep in mind that I come from a large private academic research library. In common with most private institutions these days we are extremely cost-conscious.

Requirements Of The Online Catalog

What features characterize an acceptable online catalog? Here are some features which, based on our experiences at Northwestern, contribute to satisfaction on the part of library patrons and library staff.

1. The data base must be comprehensive.
2. The system must be "user friendly."
3. The data base must be accessible by at least as many access points as in the card catalog.
4. The system must have good response time.
5. The system must be affordable.
6. The system must be available.
7. The system must have a visible, comprehensible "structure."

8. The level of cataloging in the data base should be high.

9. The information provided by the system should include status and detailed holdings information.

Comprehensiveness

Comprehensiveness has a number of aspects. Given the restrictions of budgets, what must be included in a data base to insure maximum usefulness?

Serials. One aspect of comprehensiveness relates to the inclusion of serials. In a large research library, to exclude serials is to seriously limit the online catalog's usefulness. At Northwestern, we have found that including serials in our data base has contributed, not only to user satisfaction, but also has enabled us to maintain a level of control over this notoriously hard-to-control form of materials which would never have been possible with a manual serials system. And make no mistake--the ability of a library to control its materials is a big factor in patron satisfaction.

Retrospective Coverage. How much of the data in the card catalog must be in machine-readable form before a library can make a decision to close the card catalog and go online? The answer is obviously "all." In reality, in all but a few fortunate libraries, most libraries will have to be satisfied with starting with a data base which is less than complete, perhaps converting gradually over an extended period of time. At Northwestern, when we made the decision in May 1980 to make the records in our NOTIS (Northwestern Online Total Integrated System) available to the public through our user cordial interface LUIS (Library User Information System), we had over 400,000 titles in the file, which

included all serials (current as well as dead) plus most book acquired since 1970. Although undoubtedly some users will be inconvenienced by having to consult both the online catalog and the card catalog, the alternative of not going online until we had converted was not acceptable to us. Our hope is that once we close our card catalog and have in its place an operational, efficient online catalog, we can find some resources to divert to retrospective conversion.

Data Elements. Another question that still comes up from time to time in conversations with people considering online catalogs is "how much of the content of the MARC record should be carried in a local online catalog?" My answer is an unequivocal "All." Given the dramatic decrease in price of online storage, and considering the convenience of having the entire MARC record online, available for update, there is no longer any necessity to consider carrying a subset of MARC data. Based on ten years of having an online catalog available for staff use, we find that although few users need complete bibliographic data all of the time, almost all users need it some of the time. It should also be mentioned that the user group which most frequently needs full data is made up of faculty, graduate students, and staff. The first two groups become very vocal if they find they have lost something previously available to them. In the case of staff, their operations would be seriously impaired if they did not have easy access to full bibliographic data. Considering that, at Northwestern, almost half the users of our card catalog are staff, this is not an insignificant factor.

Flexibility

Over and over again I hear librarians using as justification for an online catalog the fact that the search flexibility of an online catalog will be so much greater than in the card catalog. What features contribute to flexibility?

Search Codes. Once in a while I run into someone who, in all seriousness, believes that users can learn to approach a bibliographic data base by means of search codes of the type used by OCLC. Our experience leads us to the opposite conclusion. Such short, derived, pre-coordinated search codes are very efficient from the standpoint of computer processing, but are not suitable for users, even for staff as users. An earlier version of NOTIS (of which LUIS is the patron access component), had this type of access, and we found that even when the user was an experienced staff member, with piece in hand, it was difficult to derive search keys for any but the most simple entries; without the piece in hand, or when the user was inexperienced, search code access completely broke down.

Key Word Access. If derived search codes do not provide adequate access, what does?

Every librarian I know freely admits that the card catalog has serious deficiencies for providing access to a collection. This disenchantment with the card catalog has perhaps led us to conclude that if the card catalog is so inadequate for access, why imitate it in the online catalog? Why not switch over to the keyword, Boolean logic type search techniques such as that used by the suppliers of online access to indexing/abstracting data bases?

On the surface it is intriguing to think about being able to search using words from anywhere in a bibliographic record, combining those words with "and," "or," and "not" operators. Corporate authors immediately come to mind as standing to benefit from this access method. Before deciding on this feature, there are two basic points to be considered. The first consideration is whether or not library patrons can adapt to formulating their searches in what is essentially a mathematical mode. A second consideration is cost.

It needs to be pointed out that Boolean logic is not difficult to provide to a library data base of MARC formatted records provided the data base is not updatable online. It is not the initial cost of the system and software, it is the ongoing operational cost which I have serious doubts that most libraries will be able to justify. Boolean type searching eats up a lot of computer resources, even when the software is maximized for efficiency. Unfortunately, also, you can't always tell from an initial testing how the system will work under future conditions. A system which works very well with a relatively small data base with relatively few access points and a relatively small number of simultaneous users may grind to a halt when the data base increases and the number of users increases.

And increase it will! Even in our situation where we have a relatively small student body (approximately 9,000 on the Evanston Campus) and where we don't yet have subject access and still have a backup card catalog, we have been surprised at the amount of use being made of LUIS. My reservations about keyword, Boolean logic searching of cataloging data bases are not due to any concern over user acceptability; in fact, the initial reaction would probably be enthusiasm.

Also, there are being developed "user cordial" interfaces which take the user step-by-step through a search. I am not, however, convinced that the naive user can conduct a "good" search. A good search I define as one which retrieves everything the user needs with very little extraneous materials and which does not place too great a demand on computer resources. I suspect that in order for a search to be both productive and operationally efficient, the user must have a good deal of knowledge about both the structure of the data base and its content. I think that many reference librarians who presently mediate searches of online indexing/abstracting data bases would agree that it is the rare patron who is prepared to conduct a data base search without assistance. Are we prepared to provide this level of assistance to all the users of an online catalog?

For a search to be productive in a large data base, the user must know how to select "distinctive" terms. Another challenge to the naive user is to decide how to restrict a search, in order not to be inundated with non-relevant data. On the other hand, he must be careful that he does not "miss" data.

On the last point of "missed data," online catalogs are particularly vulnerable. I have observed many users at our terminals, when the computer responds with a "no entries found" message, accepting that message at face value. I doubt that they are quite so trustful when they approach the card catalog. My guess is that this lack of skepticism results from the fact that the computer data base and the method of accessing it are "invisible." The sheer bulk of the card catalog leads to the conclusion that there might be something there which the

initial search missed.

Even assuming the user is skilled in searching, I think we have also been oversold on the idea that by using words in titles we can substantially improve our ability to locate materials on a particular subject. In the opinion of many of our librarians, this may apply in the sciences, and to a lesser degree in the social sciences, but it does not apply in the humanities.

Title Keywords. It is my opinion that non-selective inclusion of words in titles simply loads up the index with non-significant words and imposes an additional burden on the user, as well as on the computer. What is needed, perhaps, is access by "selective" words. But how do you decide what words should be selected?

One device being used to minimize the impact of searches on non-distinctive words is to use "stop words," words which, if used in a search, will cause the computer to reject (or at least delay) the search. An unfortunate situation exists in library data bases in that many entries, names as well as titles, are composed mostly (sometimes solely) of stop words. What does the user do then? The solution adopted by some systems is to develop indexes which allow you to specify "positional" or "adjacency" relationships between words--"American" before "Medical" before "Association." When you add such capability to a system, up goes the load on your computer again. A real "catch-22" situation.

This brings me to my point. At Northwestern, concerned as we are about costs, we have elected, for the near-term at least, not to use keyword/Boolean searching in our "local" system. However, this does

not mean that our users who don't know the precise author or title of a work are out of luck. As a member of RLG, there will be an exact copy of our local data base on the RLIN computer. RLIN does provide keyword access. Consequently for that small number of users who need keyword access, we can make it available to them, without having to pay the costs which would be involved if all our searches had to be conducted in this manner.

We recognize that for the short term this requires a user to use two types of terminals and two sets of protocols. Eventually this will no longer be necessary. The Council on Library Resources is funding a project to develop an "application level" protocol which will permit computer transfer of data. The Council is also funding a project to try to determine if there can't be developed "end user protocols" which are similar from system to system. Developing such standards will take time, but it will eventually be possible for users to switch between systems with relative ease.

Response Time. But let's say your users can't access your data base on the network system and so you decide to implement keyword access on your local online catalog system. It is likely that there will be a honeymoon period, during the time the data base is small or the number of simultaneous users is small. But as the number of users grows and the data base grows there is a good chance that eventually response time will start to deteriorate. If you are at all concerned about user acceptance of an online catalog, you will be in trouble. At Northwestern, prior to acquiring a library-dedicated computer, we shared a computer with the University's Administrative Data Processing Department. For

awhile all was rosy. Then a number of administrative applications were implemented without upgrading the computer, resulting in response time degradation. Users (fortunately only staff) were frustrated and angry. There is something about staring at a recalcitrant screen which aggravates the most patient person. It's to no avail to tell him that it would take longer to do a task using manual files; he sees wait time as wasted. As soon as we got our own computer and response time became almost instantaneous, the attitude of the entire staff changed.

Because we want to keep response time good, we have delayed implementing subject access until there was a reasonable chance that it would not overload the system. I would guess OCLC's delay in providing subject access is at least partly due to concern over the processing load it would impose. If you simply consider the number of entries under some of the LC subject headings, you can see what doing a subject search involves, even when you use a precise LC subject heading. Consider a heading such as English literature or United States--Politics and Government. Searches on such common subject headings could tax a very large computer, unless they were carefully qualified. And qualification, as I've indicated, requires an intimate knowledge of the data base content.

Affordability

As I've indicated, the features of a system have a cost associated with them. It is critical that features be selected which not only contribute to user satisfaction, but which are appropriate to the data base and which can be implemented without prohibitive costs. The structure of

the data base can make or break a system. At Northwestern, we have used an index structure which has proved very efficient. For lack of a better way to describe it, I have been calling it "structured access." Structured access relies on a file of bibliographic records each of which is in a format which is similar to the MARC communications format, but which has been slightly revised to make it easier to create and update online. From these records are extracted, at the point a record is created or updated, "index records," which are pre-coordinated in that a single index record is drawn from several fields in the source bibliographic record. One record is generated for each field which has been designated as an access point. These index records are used to update, either dynamically or on a batch basis, an index file. The index records consist of a "heading," followed by "qualifiers." The qualifiers used with any particular heading are selected based on our experience as to what data elements, when used in conjunction with a heading, provide the greatest degree of differentiation between items. For example, if the heading is a main or added entry and the format is "book," the qualifier is the main title and the data of imprint; if the heading is a title, and the format is serial, the qualifiers would be the main entry (if other than title main entry) and the place of publication. These index records are stored alphabetically in the index file, in large blocks, using a high level of data compression. As a consequence, a single disk access serves to retrieve many potential candidates for satisfying a search. Under conditions where tens of thousands of searches are issued per day, saving disk accesses contributes significantly to system efficiency and economy.

Northwestern's concern that an online catalog available to the public should provide the greatest possible benefit at the lowest possible cost is consistent with our insistence on economy of operation in our materials control system, an online system which encompasses all the major library functions--searching, ordering, check-in (including serials), claiming, in-process control, cataloging, circulation, and inventory control. The user interface is simply another "view" of the data base--a natural "byproduct" of NOTIS. This means that we get an online catalog at a fraction of what it would cost to have a standalone online catalog.

Over the years we have seen computer costs coming down, but concurrent with that cost decline we have been using computers more. Computer costs will never get to the point where we can be cavalier about wasting them.

As I look at the sudden rush on the part of commercial vendors to take advantage of the demand for online catalogs, I would predict that for every really efficient system there will be a number of inefficient systems, developed in haste or built around obsolete technology. Unfortunately, it's difficult to distinguish between the good and the bad. Although the poor ones will eventually die, in the process many libraries are going to get burned.

Availability

But let's say you find a good system, one which you are positive will do the job at an affordable cost. In an academic institution you must be prepared for some degree of resistance. Faculty, in particular,

will be slow to accept it. How do you convert them to the cause? One strategy for gaining faculty support for online access as a substitute for, not just an adjunct to, the card catalog is to make it available, not just in the library, but in departmental offices. At Northwestern we are beginning a project to "distribute" the catalog to faculty in their offices. We are confident that even those faculty members who are presently lukewarm about the idea of an online catalog will be won over. Library staff, also, have to be enthusiastic about having convenient access to the catalog.

Structured Access

I mentioned that a visible "structure" contributes to the success of an online catalog, and also that the catalog, unlike an index, provides such a structured, systematic approach to locating materials. What does this mean? It means that a catalog is structured in a very formalized way. The level of analysis is low (which is why keyword access is not as effective in a cataloging data base as in an indexing data base), but the structure is designed to compensate for that limited analysis.

The structure of the manual catalog (card or book) is its strength and we should not lightly cast it aside. If we do, we run the risk of ending up with a data base which is completely out of control, incomprehensible to staff and patrons alike. Any cataloger who has inherited a poorly-maintained catalog can appreciate my concern. I am very concerned that system designers do not appreciate how important it is that a searcher be assured of comprehensiveness of recall. There must not be

split files--all works of an author must file and display together; all editions of a work must file and display together. It should be possible, having determined that there are works under a particular subject heading, to be confident that all works on that particular subject have been retrieved.

An online catalog also requires that there be a syndetic structure which enables headings to be linked together. I don't think librarians, catalogers in particular, have effectively communicated to systems designers just how important it is that this syndetic structure be maintained. Even more significantly, I don't think it's been generally recognized that the reference structure of an online catalog requires that there be, if not an authority control system, at least an authority management system.

User Friendliness

If an online catalog is to be an acceptable replacement for the card catalog, it must be easy to use. Obviously some of the features I have already mentioned contribute to user friendliness--for example, a visible comprehensible structure, availability of terminals, and good response time. I also expressed my personal opinion that search codes were not an acceptable means of searching a data base and that, although keyword searching had a certain appeal, it was not required in order for a system to be easy to use. If neither search code nor keyword access is the answer, what kind of access is required for a system to be considered user friendly?

At Northwestern we think we have achieved a balance which is both

easy to use and processing efficient. The NOTIS/LUIS system, as I mentioned, utilizes an index file made up of structured, pre-coordinated index records each of which contains a heading followed by one or more "qualifiers." The user approaches the index file "generically," entering as much or as little of the heading as he wishes. If a search results in multiple index records being found, he can "browse" through them. Up to 17 index records are displayed on a screen. If there are more than 17 entries, the user can "page" through them. When the searcher finds the heading he wants, then he scans the qualifiers associated with that heading to determine the exact work he wants. Because the records are displayed in groups, and because our response time is good, even a search which results in many index records being found can be finished quickly. The point I want to make is that, instead of a user having to explicitly qualify a search term which results in multiple matches, the system "assists" the searcher by supplying qualifiers which can be viewed "in context." I call this "computer assisted qualification." The result is a maximum level of comprehensiveness of recall (few missed matches) and an easy way to identify and reject mis-matches. Another advantage is that the entries are arranged in a format which is familiar--the user understands the logic of the system. He interacts as an equal with the computer. This computer-assisted qualification, to my mind, contributes to the system's friendliness.

Guide Records. NOTIS/LUIS has another type of built-in user assistance which we call the guide record technique. It was modeled after a technique used in the card catalog, that of inserting "guide cards" at

strategic points in a drawer. It also has some resemblance to the guide record technique used by LC in their MUMS system; however, we refined it to suit our type of index structure. Basically a group of index records retrieved by a search term is broken down into up to 17 "sub-groups" or "intervals." The number of records in an interval is variable, so that we don't have the situation where the user doesn't know on which side of a guide record to look. The cutoff point between one sub-group and another is based on the degree of alphabetic difference between adjacent records. For example, the search term MILLER, H might result in the following list of guide records:

1 MILLER HAD

13 MILLER HAR

56 MILLER HER

etc.

In some respects a guide record resembles the guide notches in a dictionary or the guide terms at the top of pages in a telephone directory. The guide records "assist" the user in refining his search. By selecting a line number on the guide record screen the user can then transfer to the regular sequentially-ordered index, beginning at the selected point. Such assistance contributes to user friendliness.

Authority Control and References. I've mentioned that authority control and references were essential requirements for an online bibliographic data base to qualify as an online catalog. The provision of cross references is one way to insure that the user finds what he is looking for. An authority system which detects and reports conflicts and blind references also makes the system more effective.

Prompting. One of the differences of opinion among system designers is how much "prompting" is necessary to qualify a system as "user friendly." At Northwestern we have opted not to use an elaborate system whereby the user's hand is held through a search. LUIS is, essentially, a "command driven" system. However, we have tried to keep the system protocol very simple, and to back it up with an extensive system of "help screens." Our observations so far confirm that users have adapted very well; they walk up to the terminal, read the instructions on the introductory screen, and take off.

Level of Cataloging

Not all the benefits to be derived from an online catalog will be directly related to the system which supplies access. I have referred several times to the fact that catalog data is deficient, not from a structural standpoint, but because the level of analysis is low. Catalogers deplore this fact, but in the face of constant pressure to produce, they have been unable to do much about it. I predict that when we arrive at the day when catalogers are relieved of the mammoth burden of maintaining manual catalogs--when they are working with a catalog which cannot only be searched online but which can be updated online, and when the time-consuming tasks of authority control can be simplified by means of an online authority system--this emphasis on austerity of analysis will gradually fade away. What will result is what some people are calling enriched cataloging. Such enriched cataloging will provide selective, significant access, not unselected trivial access of the type provided by keyword access. Already at Northwestern, even though we are

committed to following LC, we have deviated in the sense that wherever we can we provide additional access points. For instance, we always index on titles, no matter how non-distinctive. We also add "variant" and "alternative" title added entries whenever it appears desirable. No longer do catalogers try to avoid making an added entry or a reference.

References. Another type of enrichment takes the form of copious use of references. When you have an online authority file, where a tracing automatically generates a reference, you can be much more cavalier about deciding that a cross reference is appropriate. We are looking forward eventually to bringing up the LC subject heading file online, in order to provide a level of references which has never been possible in our manual subject catalog.

Analytics. Earlier on I referred to the fact that a good online catalog should be cordial to all forms of materials: books, serials, music, films, manuscripts, etc. There is another form of material which I predict will eventually begin to appear in online catalogs to a much greater degree than at present, and which has the potential of greatly increasing its usefulness. I am referring to analytics and indexing.

LC has developed a draft analytics format which is under review. At Northwestern we have implemented a version of that format, and our experience with it has been very positive. Especially in special libraries, there has long existed a need to integrate the indexing of journal article literature into the catalog. We now have an opportunity to do this. At Northwestern, our Transportation Library is using this

format, and we are also using it for the indexing of conference papers held by our Africana Department collection. Eventually it should greatly simplify and improve music cataloging. And of course it is a natural for serials which are classed together but which are individually analyzed. Finally, it has the potential for getting us out from under something I consider an abomination: contents notes.

I could go on and on, but the essence is that we are on the brink of achieving what Mike Malinconico of New York Public Library has called "an harmonious articulation" of these two forms of bibliographic data: cataloging and indexing.

Holdings/Status Information

Not all the potential for catalog improvement derives from providing additional access points and improving the level of cataloging. An absolute requirement for the online catalog, to my mind, is that it be able to provide the user with up-to-date information about detailed holdings. For example, how many of you have catalog cards which, for serials, contain a cryptic statement to the effect that "for holdings see serial record" or "for holdings see shelf list" or "for holdings see Kardex." If you do, how often has it been necessary to trek to a back room where you are forced to try to decipher an even more cryptic set of records and symbols?

To add insult to injury, even after you've determined that an item is held by the library, you don't know if it's on the shelf. If it's a current issue of a serial, you often can't tell if it has been bound and is available or not.

In an integrated system such as NOTIS/LUIS, such incomplete, out-of-date data is a thing of the past. If I had to name one feature of NOTIS/LUIS which contributed most to its success I would say it was the provision of a central unified serial record, available on a decentralized basis, which had complete data on serial holdings. By complete, I mean precise volume/issue level data, including current issues. Because NOTIS has a serials check-in component, the second a journal issue is checked in, it is reflected in the data base, accessible to patrons and staff alike. Sometimes the records are almost too current. For example, the current issue of a serial will appear in the file even before the truck on which the serials checkers place the issues after checking them in can be wheeled to the Periodical Room. Only in a system in which acquisitions is integrated with cataloging, serials check-in is integrated with acquisitions, and the online catalog is simply a by-product of the processing system will you achieve this immediacy.

I'm sure many of you have been inconvenienced by having to consult multiple files in multiple locations, but have you ever really thought about what the user goes through in trying to locate a periodical issue in a large research library? Not only do most card catalogs not tell him if the library holds a particular issue, but when current issues are shelved in a different place than the bound volumes (as they often are), he doesn't know which place to look.

Status Information. Even if a user can determine where the item should be, in a system based on a card catalog, he doesn't know if it is available for his use. This is a problem with books, but even more

so with serials. In a library physically as dispersed as Northwestern, locating a serial, prior to patron access to the online catalog, could consume up to half an hour. Now the user has up-to-the-second information at his finger tips, through the circulation system, which is available for patrons from the same terminal used for access to the online catalog. The user is informed if the item is charged out and when it is due. He is informed, online, as to how he can have the item called in or "saved." This saves the user untold trips to the stacks and fruitless searching.

There is another side benefit which can result when the online catalog is integrated with in-process control as in NOTIS/LUIS. Because the acquisitions component of NOTIS/LUIS is an integral part of the data base, a user can discover, online, that a book which he needs is being considered for order, is on-order, or is in-process.

SUMMARY

The features which I have listed above are within the grasp of all but the smallest libraries today, at a cost which is affordable. There are pitfalls, but they will be overcome. Ten years ago I doubt that more than a handful of the people in this room would have predicted they would be cataloging online and circulating books online. Five years ago, the idea of having a COM (computer-output-microfilm) catalog was considered revolutionary. Today, everywhere I go people are discussing the closing of catalogs and their replacement by online catalogs. It will come, and sooner than we think. The challenge is to make the transition a smooth one.

PLANNING, CREATING, AND MAINTAINING THE BIBLIOGRAPHIC DATA BASE

R. Bruce Miller

To help you understand the framework of this presentation, it is important for you to understand that I do not work in a library that has an online catalog. Even though we have limited public access and extensive staff access to over 500,000 of our catalog records via OCLC, the absence of item or even location-specific holding information in this library that has over 50 catalog holding locations precludes even euphemistically referring to the OCLC system as our online catalog. Because I have never worked with an online catalog, I think that it would be foolish for me to stand here and to give you "how to" instructions for the care and feeding of a machine-readable bibliographic data base. We could play word games and decide to give some systems the status of online catalogs and we could reject other systems from that category. I could review the literature and I could make a few telephone calls and then I could give status reports on what is being done by the various libraries that have something that meets some of the criteria of some of those definitions of online catalogs. I could report on the system at Northwestern University, but one of the speakers today is far more qualified to discuss that system than I am. I could discuss the procedures in use for the system at Stephen F. Austin State University, but I don't care to reveal my ignorance in front of John Corbin. I could tell you about how Shell Oil took its RLIN records and loaded them

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on its own ACCIS program mounted on an in-house computer, but it is unlikely that each of you could benefit from that exact situation. I could tell you about the Gulf Companies Law Library that has access to its catalog via LEXIS in full-text mode without bothering to index access points. Pennsylvania State University doesn't really have much public access yet. The Library of Congress system is relatively inaccessible to you and me, and it is too complex to be readily meaningful for the average library.

Having given this introduction, I guess there is no point in continuing this speech, so I will conclude here. Thank you.

But wait! I am not going to let you off the hook that easily. Actually, I do have some things to say to you that you may find to be interesting and that you may also find to be useful. If, indeed, you do want to know what any given library is specifically doing, I recommend that you follow the same procedures that I do: look up the telephone number, call the library office, and ask for someone who knows something about your needs. Establish communication and borrow or share procedures as much as possible, and then tailor your new knowledge to fit your specific situation.

My goal today is to provide you with a conceptual framework that will allow each of you to determine what aspects of your bibliographic data base might require specific attention in a given situation. More importantly, I will try to establish why you would want to be attentive to those aspects. This knowledge will prepare you to ask the necessary questions during the process of planning, creating, and maintaining your bibliographic data bases. Be prepared. This is a complex subject. To

give you a feeling for the complexity of what will be discussed, I offer to you a liberal translation of a somewhat infamous motto, "Ignotum per Ignotius." The translation is: "When I get through explaining this to you, you'll know even less than when I started."

Planning the development of a data base for an online catalog can be an overwhelming task. One reason for the difficulty of this task is because an online catalog fulfills my favorite definition of a system. That definition states that a system is something that is too complex for an individual person to completely understand. Obviously the way to deal with this complexity is to segregate the system into its component parts and then to resolve the needs of each segment prior to approaching the final enterprise. In order to pursue this planning without getting lost along the way, you should have a relatively clear image of what your online catalog will do when it begins operation and you should have some good ideas concerning metamorphoses in which it may be involved in the near future. However, do not develop too much focus on the distant future, because you will develop tremendous inertia by devoting all of your energy to precisely anticipating future needs so that you do not waste any development energy or resources. Unfortunately, tremendous energy and resource wastage results from fighting that inertia. Do develop a broad concept of the future, but use that concept only as a framework. Make detail decisions based solely on the needs of today. Accept the probability that you may have to redo or even undo some of today's plans. This attitude will ultimately get you closer to meeting both today's and tomorrow's needs than will the attitude of planning only for tomorrow.

Once you have decided what features your online catalog system will offer, temper the decisions with the exigencies of what resources and methods you have for creating the data base. Will the first item that you catalog tomorrow be the first item in your new data base OR will you load your OCLC archival tapes into your system OR will you use an existing circulation system as the basis of the catalog OR will you use a vendor's tape of your catalog records OR will you hire a horde of data entry operators to input your shelflist data OR will you borrow machine-readable records from other libraries and one-by-one match your shelflist records against them OR ... OR ... OR...? Even though it is probable that I have never been to your library, I think it is safe to say that the answer to the above questions is "yes." The reason that I can confidently make that statement is that virtually all of us have to start somewhere, and that at various times in our development processes we will be converting existing records into a format that can be used in an online environment. We also will probably be forced to settle for less at some point and later we will try to upgrade that information.

We have to begin somewhere. So, let's create a hypothetical data base. First, I will begin with some assumptions that allow me to discuss the topic even though they might not be very realistic in a real life environment. I am going to assume that there is no distinction between converting an existing catalog and simply beginning a data base from scratch with today's cataloging. I will also assume that the physical format of the resultant machine-readable data will be of no concern; i.e., a more detailed discussion of conversion strategies and data base creation can determine whether the records are logical pieces

of a computer tape or are optical characters typed on paper or are in stacks of punched cards or are in some other physical form. With these caveats in mind, consider some basic questions concerning source, format, fullness, and input of data.

What is the source of the bibliographic records? The most straightforward source is an existing shelflist if that shelflist contains all of the needed data. In addition to the basic bibliographic record, both item specific holdings information and item specific location information will be required. The contents of the associated authority file will also be required. What? You don't have an authority file? Tsk, tsk. You may be in for some rude shocks when your bibliographic records escape from the confines of your card catalog and begin to parade across the screen of a CRT. Oh, you do have an authority file but it is part of your public catalog? Then somehow you need to develop a scheme that allows you systematic access to that authority data. Oh, heck. I bet that you just remembered that you have been making corrections in your shelflist when you do catalog maintenance for main entries but that you don't make any corrections when you upgrade added entries. Perhaps one of your card filers might recall that between 1968 and 1972 that the shelflist received holdings cards for multivolume sets but no related bibliographic records were created for the shelflist. Variations on this theme are endless. Close scrutiny will reveal more quirks about your catalogs than you ever thought possible. With these quirks in mind, I suggest that you carefully examine your library's bibliographic records and that you determine the most reasonable source for online catalog data. Then, as necessary, begin to upgrade those records.

Don't make a gigantic project out of this; simply begin to create records with all of the desired data and, when convenient, bring older records up to those standards. Also create and maintain a chronology or history of changes to those source records. Although I have been talking about cards as the source of your bibliographic records, there may be other possibilities available to you. If you use OCLC, you can take advantage of your archival tapes. What? You haven't been putting item specific information in the 049 field? You forgot to delete holdings when you withdrew an item? I won't rub it in by continuing to mention these details; the point is that it is unlikely that you will have a simple, "plug-in" source with perfect information. A third source is to be found in the bibliographic records of another library. I'll discuss that in a minute when I talk about input.

Deciding the content format of your machine-readable bibliographic records will raise philosophical as well as pragmatic questions. If your library is small and if you have little interaction with other libraries, you can probably use virtually any format that will meet your own internal system requirements. However, I suggest the use of the MARC format regardless of your situation. I will discuss this in more detail under the topic of standards, but here I wish to suggest that use of a standard format will facilitate training of new staff members and that it will enhance interaction between institutions. That interaction should bring benefits that will more than offset the cost of using the MARC format.

What about fullness of data? If your system can economically save and manage data that may be irrelevant to the day-to-day operation of your online catalog, I suggest that you try to save the data. It is

difficult with a fledgling system to accurately determine what will be useful in the future. Don't waste resources by creating useless data but also don't throw data away if it is readily available. Full MARC records may prove to be of significant consequence as resource sharing increases.

The actual creation of the machine-readable records can be the most expensive feature of starting an online system. Although the most straight-forward approach may be to take a prepared source record to a terminal and to sit down and key the record through the keyboard, this is also probably the most expensive approach. However, there are other options. You can load your "dirty" OCLC records (or your "filthy" records from your online circulation system) and then you can match your source records one-by-one and edit the online record as appropriate. If you don't have an OCLC tape, borrow (buy, rent, steal, etc.) a tape from a library with a similar collection, edit the useful records, and cull the records that don't match. Then input those that were not on the other library's tape. In some circumstances a vendor can do this process for you. Consider using the computer to create your authority file. Run the MARC authority records of the Library of Congress against your bibliographic records. If there is a match on an access point or a related reference, retain that specific authority record for your online authority file. Then assume that all other access points on your bibliographic records are authoritative and strip them into authority records. Add references and correct any mistakes as the access points are encountered or as they cause trouble. In my library, we have begun saving our draft authority records just

in case they might provide useful information during the creation of our online catalog. Those scraps of paper are receiving no special treatment. They literally are being tossed into a big box. If they prove to be useful, we will be very happy but if they turn out to be worthless, we will simply discard them and feel smug about having invested so little lost energy in them.

After you have created the basic data base, continue to think about enhancements. As an example, consider the cataloging that we do for items written in a non-roman script. Even though we may transcribe the vernacular description in the original alphabet of the language, we still romanize all access points in order to file them in the existing catalogs. However, when online displays of non-roman alphabets become readily available, the capability will exist to provide access to both a romanized title and the title in its original script. This will provide useful service to both library staff and the scholar. The enhancement is that will a special program it would be possible to retrospectively create additional original script fields for all romanized data. The point of this discussion is not to make you worry about the six Ukrainian books in your collection. The point is for you to continually seek ways to make the computer serve you and to provide better access to information. Don't fall into the trap of accepting automation and following its simple offerings; make automation do the dirty work and make it do the things that could never be done in the past.

It is necessary for me to momentarily digress from this simplistic discussion of creating the data base. I worked on this speech for several

months and I was continually frustrated in my attempts to coherently organize the topic. My desire was to present a step-by-step set of procedures that would simply let you trade your card catalog for a CRT. I was faced with a choice between an overview that was so simplistic that it was meaningless and a nitty-gritty discussion that would have bored you to death with arcane points concerning subfield element "this" and fixed field element "that" and so on. As I wrestled with the topic, I realized that the conceptual side of online catalogs was simple, exciting, and easy to talk about. I also realized that my worry about having a boring speech if I got into the nitty-gritty was founded in the reality of actually implementing an online system. There is a lot of non-exciting, repetitious work to be done to create an online catalog and, if you don't understand that aspect early in your development work, you may be faced with significant personnel problems that may undermine your project. With all of that in mind, I decided that the responsible thing to do would be to test your potential for this development work by being boring. I then decided that a really boring speaker is one who rambles and repeats himself. To fulfill that requirement, I am going to begin again in my discussion of creating the data base.

This time, I want to focus more on what you really want in the data base. Perhaps the easiest way to allow for all contingencies and to prepare for that online catalog that will appear someday is to prepare all of your cataloging data using the MARC format to its fullest level of detail. Then, when the data base is being developed, the programmers can obtain a copy of the MARC standards and can simply pick

and choose from the available data to fulfill the desired online features. Unfortunately, this approach is easy only in an intellectual sense. This is because the MARC format can be extremely complex which can generate the expenditure of much labor-intensive energy during the creation of data and because there is a good probability that a good deal of the data will never be needed in any specific online catalog. Therefore, before you decide how to create your data base, make some effort to anticipate what will or will not be needed in the potential online system.

If the online system will be developed in the near future, then you have a tremendous advantage because you can meaningfully answer detailed questions. The following questions are samples of some of the questions asked at UT Austin during the selection process of a data base management system for an online library information management system:

* Are there any restrictions on the number of keys?
* Can fields, keys, and records be variable length?
* What is the maximum length of fields, keys, and records?
* Is there generic search capability?
* Is there Boolean search capability?
* Is there proximity search capability?
* Is there a capability for searching non-key fields?
* Is there a capability for generalized text searching?
* Under what circumstances would the data base require reorganizing?

If you know what capabilities are offered by an online system, then you can accurately focus on the data required by that system. It may well

be that your data base management system or online system design each offer some features with inexpensive overhead that eliminate the need for you to carefully code certain aspects of your data. By the same token, relatively insignificant data for one system may be crucial for the operation of another system.

On the other hand, you may know nothing about your future system other than it probably will be online. In this situation, it is best to focus on creating accurate machine-readable data that records at least the access information found in your current card catalog. If the budget allows, consider also recording data that seems to have a good liklihood of being useful in the future.

The General Libraries of the University of Texas at Austin uses OCLC to produce catalog cards. A goal for bibliographic control is to replace the card catalogs with online access to the collections. This is such a major project that it is difficult to reach decisions today for what will be needed tomorrow. In an effort to anticipate future needs balanced with the exigencies of today's work load, we have developed OCLC edit cataloging and input standards and standards for the correction of bibliographic errors discovered after card sets are produced. I will discuss standards in a few moments in a different context. Right now I would like to show how to reach these types of decisions by reviewing the sequence of discussion followed during the establishment of standards for the use of member cataloging in the OCLC data base. Consider just the subject of editing the fixed field during edit cataloging for monographs. Each element was discussed in terms of its potential future use. Some of the comments were as follows:

Lang--The language code is mandatory for original input and is therefore always present. Experience has shown the code to be rarely incorrect. Review and edit this element only if it is noticed to be incorrect because it caused difficulty in searching. Otherwise assume it is correct.

Ctry--The country code has potential value for sorting in a future online system. However, it is unnecessary to edit the element because it is usually present even though it is not required and the number of instances in which the value is incorrect does not justify editing.

Mod rec--Once the system can accept non-Roman alphabets, values "o" and "r" will be useful in retrieving some romanized records for future conversion or addition of the non-Roman forms. However, other values in this field often take precedence over "o" or "r," so this element cannot be used reliably to retrieve all romanized records. Retrieval will be based upon the language code and the "Title romanized..." note. Therefore, Mod rec need not be edited.

Dates--Dates have potential value as an access point in a future online system. However, it is unnecessary to edit the element because it is mandatory for original input and the number of instances in which the value is incorrect does not justify editing.

Each of the fixed field elements was reviewed in this manner. Consideration was given to the requirement to replace all blank fill characters with valid codes in order to update the fixed field for even one element. Editing times of several minutes were often observed. These times when compared with 70 to 80,000 titles edit cataloged per year cumulated to approximately the equivalent of one full-time employee used solely for the updating of an insignificant number of fixed fields. Based on all of these observations, the final decision was to always assume that the fixed field in any record contained correct information and to spend no time proofreading or editing that portion of the OCLC record.

The point here is not that this is a specific decision that your library should implement. The point to be established is that each library should review its abilities, its work load, and its needs and

then should pragmatically decide how to achieve the greatest quality control for the greatest amount of useful information.

To help you make these decisions, you should know what standards that you will want to follow and what standards you will be obligated to follow. When I use the word "standards" in connection with bibliographic data, images of quality, uniformity, and interchangeability should come to mind. However, if you have thoughts of rigidity and inflexibility, then you are not making standards work for you. Standards allow us to take advantage of sharing and the economies of scale. They free us from time-consuming, repetitive decision making every time a situation occurs. Standards allow for effective use of division of labor.

To benefit from standards it is necessary to keep a close eye on them. If you leave them alone, they can breed like rabbits. Just consider some of the standards that you may need to coordinate for an online catalog. There is AACR2 and ISBD. It is likely that you will use MARC. The OCLC input standards will probably be in your path at some point. Don't forget about machine protocols, electrical currents, x-ray emissions, and even the height of a terminal from the floor. ANSI, ISO, and the Bureau of Standards will compete for authority. I imagine that OSHA will get into the act if you allow it. And then, to top things off, you are going to create your own inhouse standards. If your online catalog is only part of a more comprehensive library information management system, the basic catalog information will also be obligated to merge with acquisitions and circulation data. If the catalog data comes from OCLC, you will have to develop standards for editing member input. Also, you need to detail the conditions under which you will correct mistakes or will simply decide to live with them.

Now that you can see the snarl into which standards could place you, I will offer you a simple pocket knife (a sword is not really necessary) with which to unravel this Gordian knot. The advice is simply this: aim for consistency but not at the expense of everything else. It may seem flippant to say that everybody's standards are frivolous except your own, but I believe that there is some truth in that statement. Do your best to meet the needs of vendors, utilities, and sources of catalog data but always attend to your individual special needs first. Also remember that one of the reasons for the use of machines is to make them do the dirty work. Although you cannot make something from nothing, if your inhouse standards have been consistent, albeit simple, it should be reasonable to require the computer to translate your data to meet most of the standards and requirements of any outside body with which you need to interact.

Let's move to a new topic now. You have corraled the standards and are now online with your new data base. Call the movers and haul away the old card catalog. "Wait!" you say. "We couldn't afford to convert everything that was cataloged before we started the online catalog." This is a rotten situation, but realistic economics mandate its occurence. If you are going to live with both a card catalog and an online catalog, it is necessary to clearly define what is in each catalog so that they can be used effectively and so that maintenance can be consistent and efficient. As is usual for library processes, there are no simple decisions to be made here. This situation is primarily due to the collocating purpose of the catalog and to the non-static nature of catalogs. When a new edition of a work is received, will its cataloging

be placed in the card catalog or the online catalog? Will you transfer all cataloging for the different editions to the online catalog or will you allow them to be separated between the two catalogs? Serials and multivolume sets require continual updating. Will you maintain already cataloged serials in the card catalog and newly cataloged serials in the online catalog? Where will you put new cataloging for an added copy that is for a new holding location? Will you continue to place cataloging for Chinese materials in the card catalog because you do not have a good method for entering Chinese online? What level of authority control will be offered? Can you afford to provide references and links between the two catalogs or will you just give up and make catalog users always search both catalogs? A choice must be made between segregating the two catalogs on the basis of cataloging date or imprint date. One choice helps your bibliographic control processes; the other sometimes helps the user and public services staff. Close the card catalog and carve it in stone by microfilming it or by converting it to book form. What will you do then about withdrawals, reclassifications, transfers, corrections, or other updates?

I could drive you crazy with these questions for hours, but that would not be very kind. I could also walk away and give you no answers. Being both brave and also a little foolish, I will go out on a limb and offer at least one simple answer. The answer is based upon by observations and upon feedback that I have received from some libraries with two catalogs. The answer to the question is to have only one catalog. Of course, as I mentioned before, if you change to an online catalog, it is probably unrealistic to convert all of your old catalog at one time.

Therefore, I suggest that you pursue that goal but also that you realistically seek it in stages. Start your online catalog with as much data as you can gather. Then transfer all of your serial records in a special project or settle for the transfer of one title at a time as you handle them. If you are adding a new edition of a work, shift the other editions at the same time. Start a project to move all of the cataloging for Shakespeare to the online catalog or focus that project on your textbook collection. When you empty a set of catalog drawers, sell them to finance the next project. Use special appropriations, coerce special help, take any opportunity or excuse, use any advances in technology, and sooner or later the card catalog will be gone. Think in terms of the long range goal. Remember that it was not very many years ago that even the mighty OCLC was centered around a tiny data base subsidized by a few Ohio libraries.

I would very briefly like to talk to you about the day-to-day maintenance of an online catalog. Do not fall into the trap of simply replicating the manual procedures that were required by the old card catalog. Make the online system do shelf listing and checks on literary author numbers and make it keep track of your authority control bookkeeping. Make the system do anything that wastes the time of somebody smart like you. On the other hand, be realistic about your demands. Some things that are relatively easy for you to do with a small paper file might be very difficult in a fledgling online system or they might radically affect the system response time. Be extremely progressive but balance your creativity (or laziness) with reality.

Part of my assignment today is to discuss backup files. Ignoring the fact that some of your data will not be online in the near future,

I can see only two reasons for backup files. The first reason is to keep duplicate files to maintain security in case of a computer catastrophe. This is actually the province of your automation staff and it is standard procedure for computer centers. The other reason for maintaining backup files is to have a duplicate of the online information in a manual form to provide the library user with access to the collection when the system is down. I have worked closely with large library catalogs long enough to realize the truth in the statement that the card catalog is <u>always</u> down. If the card catalog user can tolerate a catalog that is permanently down, why can't that same user tolerate an online system that is down only 5% of the time or 4% or less...?

A few minutes ago I made the statement that I was foolish enough to provide the answer to a question. I will tell you right now that I firmly believe the preceding down-time argument. However, I am not foolish enough to try to sell it to a professor with a grant deadline or a football player with a term paper due tomorrow. As a matter of fact, I imagine that you would have difficulty telling anyone that the online library catalog is broken right now and asking them to return later. Also, I have never seen a computer system that works 100% of the time. With these thoughts in mind, again the desire should be to achieve a rational balance. Assume that you have a set amount of dollars to spend on the down-time problem. Use the smallest possible amount of that money to create card, book, or COM access to the library's materials. Create only minimal access and update those records as infrequently as possible. Then divert the remainder of the money into hardware and software to stabilize the online system and obviate the need for backup files.

There is another variation on the topic of backup files. Printouts and other hard copy output can be used as substitute for lengthy online searches and for access to subjects or special collections. These procedures can free terminals for other use and can be used to enhance response time.

Now you have enough information to get started but getting started is definitely not the end of the line. Think about what an online catalog can mean. In simple terms, an online catalog should be a system that provides online access to an organized body of information. Assuming that a library catalog has certain characteristics, an online replacement of that catalog must at least replicate the positive characteristics by providing the same types of access points and by serving the same volume of catalog users without requiring a greater investment of time or energy from those users. These minimum requirements are sufficient to define the basics of an online catalog, but the goal of an online catalog design should be to allow continual enhancement to those characteristics to provide easier, more comprehensive access to information. The online catalog must be a substitute for the card catalog, but it also must offer much more.

Every terminal is effectively a union catalog. This means that you can decentralize your catalog and can locate terminals wherever they might be needed by users. Place terminals in the stacks. Place them in professors' offices. Put a few in the student union building. Allow dial access so that users can access the library at their homes.

Provide more access points to the bibliographic records. Use nontraditional access points. Allow Boolean logic to find books written in

Italian that were published in France before 1850 and that are over 30 centimeters tall and that have illustrations. Provide searches on keywords and on truncated data.

An online catalog can simplify catalog maintenance activities and allows the rapid availability of information. Filing is not only instantaneous, it is also ruthlessly accurate. Authority control can be more accurate, more meaningful, and more reactive to changes in cataloging rules. Paradoxically, rigid authority control may be less necessary due to the availability of searches that use non-traditional access points.

Link the catalog with other library systems. Tell the user that an item is on order or that it is checked out. The online catalog can economically provide useful information on the physical location of items. Instead of a cryptic call number, the system can translate location codes and tell the user that the desired item is in the library on 21st and Speedway on the sixth floor in the oversize book section in the northeast corner.

I could continue this pie-in-the-sky stuff all day, but your presence here indicates that it is not necessary for me to sell the idea of an online catalog to you. Rising costs and the information explosion have driven us to the need to substitute online catalogs for card catalogs. However, as we prepare the bibliographic data bases and as we develop the online systems, we must realize that it is both our obligation and a fantastic opportunity to move beyond simple substitution into the realm of readily-available, easy-to-interpret information for the users of our libraries.

SELLING AND EXPLAINING THE ONLINE CATALOG TO A USER COMMUNITY

Elizabeth Wallace

I would like to open my presentation with two quotes. The first is from a student making a comment on a user survey conducted at Steen Library, the University Library of Stephen F. Austin. The student commented: "I have no experience with or knowledge of computers whatsoever, and therefore, I feel both inconvenienced and discriminated against." The other quote is from a book by Joseph R. Matthews, Choosing an Automated Library System. Mr. Matthews stated, "Unlike ducks and water, people do not take naturally to computer systems. People, both staff and patrons, must be properly introduced to the computer and oriented as to how computers work--and how computers do not work. They often must be cajoled into using the computer and seeing the ways the computer can help them in their work."[1]

It has been our experience at Steen Library that many individuals do take naturally to computers in the form of our online catalog and enjoy using it. However, there are lots of other people who feel like the student just quoted and the persons described by Mr. Matthews. Because of these potentially dissatisfied users, we need to address ourselves to the question of how to sell the online catalog and to consider staff and user acceptance of online catalogs.

I would like to discuss my topic from two standpoints. First, to assess the degree to which existing online catalogs have been accepted

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by staff and users; and, second, to discuss factors that contribute to staff and user acceptance and thereby promote the selling process.

The few reports I found in the literature concerning user acceptance of existing online systems were all positive. For example, Savage reported in "News in Review, 1980" that "Pikes Peak found a surprising majority of its patrons favored online access over manual."[2] According to Library Technology Reports, at Northwestern University, indications are that users consider online terminals acceptable substitutes for the card catalog.[3] A report on the CLSI touch-sensitive, online catalog installed at Evanston (Illinois) Public Library revealed that public response to the public access catalog had been excellent and that the librarians were surprised at patron reactions to the new catalog.[4] In addition, the article reported that when American Libraries asked Evanston library patrons their opinions of the online catalog, the responses were mostly positive and the article further reported that users found the catalog easy to understand, unintimidating, and fun. The staff of Iowa City Public Library echo Evanston's findings and report that their patrons are turning away in increasingly enthusiastic numbers from the now dead card catalog.[5] Arret, a reference librarian at the Library of Congress, in reporting on a preliminary survey of readers using Library of Congress online information systems at the Library's Computer Catalog Center reported that when asked whether the online system could replace the card catalog for the readers' particular purpose that day said the answers were almost evenly split "yes" and "no. "The general satisfaction with the system was encouraging. One user even commented that it was the best use of her tax money she'd

come across in Washington."[6]

Since at the present time documentation on user acceptance is limited and seems to be almost non-existent on staff acceptance, most of my comments will be based on first-hand experience with the online catalog at Steen Library, in operation since January 1980, and on information gathered from our staff and users.

Annually, at Steen Library, we conduct a user survey using random sampling techniques to query user acceptance, problems, etc., concerning library service in general. On the survey taken last November, we added a question, "Did you use the online catalog?" If the person answered "yes," they were advised to "feel free to comment on the experience." Much of the material on user acceptance I will be sharing with you was gathered from that survey.

Most of the information on staff acceptance I will be sharing with you was gained from a staff survey covering only aspects of the online catalog. This survey was taken in February of all our full-time employees, both professional and non-professional.

In addition, I will be sharing personal experience gained from working with the catalog myself and from interacting with members of our user community for the past 15 months since our catalog has been in operation.

So that you can view our experiences and the acceptance of our catalog against the appropriate background, I will mention that Steen Library is a subject-divisional, open-stack library housed in a four-floor building. Our library staff consists of 18 professional librarians and 22 non-professional staff members. Our holdings total approximately

750,000 volumes in all formats. From 1973, when we moved into our present building, until going online with our catalog, we had serviced the collection with a three-way, divided card catalog located on the first floor. There was no card catalog access to the general collection on the upper three floors. Our user community consists of about 11,000 students and 450 faculty members and, in addition, we offer library service to the general community for about a hundred mile radius. Therefore, we not only interact with faculty and students, but with many non-academic users, from elementary school age to senior citizens. Since we do serve a wide variety of users, I feel the experiences at our library will be relevant and hopefully helpful to each of you regardless of the type of library you represent.

We, as is true of most libraries, were experiencing a tremendous expense for maintenance of the card catalog and yet always seemed to have a big backlog of cards waiting to be filed, records to be changed, or cards to be pulled. The need for a better, more efficient system had been evident for a long time, and for several years alternate plans had been considered.

Too, before I discuss the degree of staff and user acceptance of the online catalog at Steen Library, I must point out that our system was not designed for public access. We were looking basically for an automated circulation system. After a contract was awarded to DataPhase Systems for a circulation system, we discovered a function, "Inquiry," within the system which appeared to lend itself well to an online catalog application. We dediced to use it. Although we realized we would be unable to change much of the system design and would be required to

accept software as written, the advantages to using their system for our library's catalog seemed to far outweigh the disadvantages. This decision allowed us to use the same data base for our circulation system and online catalog; to skip the COM catalog phase which had been just recently, but reluctantly approved by the staff; to build toward an integrated automation program; and to begin our online catalog years sooner than we had dared dream. So it was that we went online with our public catalog in January of 1980 with three terminals located on the first floor in the card catalog area near the Information Desk and with one terminal located near the Information Desks on each of the upper three floors, plus a terminal in the Special Collections area. All terminals, except one, are on counter-height tables. One was placed on a desk to provide access for handicapped persons.

As can be expected with any new system, especially one which was not designed for public access, there are features we would like to see changed or improved; but I am pleased that I can report to you that the catalog has been favorably received by many of our users and the majority of our staff. On the staff survey, most of the library staff estimated that at least 75% of our users are satisfied users of the online catalog. Of the 279 persons answering the user survey, 130 reported they had used the online catalog, and 97 took the time to comment on the experience. Only six of the comments were completely negative. I quoted one of those negative comments at the beginning of my talk. Other such negative comments were "Much too complicated for my feeble mind;" "I did not understand. It was too confusing;" and "It didn't help me find anything. It was frustrating." Forty-one made unqualified

favorable comments such as "I thought it was fast and efficient;" "I enjoy working on the online catalog. It is a new experience for me. I feel it is faster than looking things up in the card catalog;" and "I think it's neat, besides, I love to play with computers." There were 45 negative comments concerning our small data base, insufficient and/or inadequate instructions, and difficulties encountered in determining subject headings. These problems and comments will be discussed later. Consistent with findings reported by CL Systems, we have found that the younger the user, the less intimidated they are. We observe many junior high and high school students, and even elementary age children, using the terminals effectively. In fact, they seem to experience, on the whole, less difficulty in using the catalog than many of our more experienced library users.

My experience has been that the group demonstrating the most user resistence is the faculty. None of the faculty commented on the online catalog on our user survey; however, many have made negative comments to library personnel. Some have commented that it is depersonalizing; others have expressed their concern that data will be lost. One faculty wife commented, "My husband is just sick about all of this?" (referring to the online catalog). Other faculty members have complained that they have just now learned how to locate material under the Library of Congress system and now you start this! (By the way, we have been cataloging in LC for the past 9 years). Another professor told me, "It just breaks my heart to see staff pulling cards from the card catalog. Can't they just leave them alone, since they are already there?" I certainly should not leave the impression that all faculty members have this kind of attitude, because we do have many who have expressed satisfaction with the

catalog and use it regularly and efficiently. But I warn you--this will probably be the most difficult group for you to win over to the new concept. Perhaps part of the reason is that they just don't want to have to change old habits or learn "new tricks" so to speak. I have found that many faculty members are totally unaware of the many deficiencies of the traditional card catalog and are in many ways out of touch with library activities. Maybe this is not true of your faculty, but it was demonstrated rather clearly to us when our card catalog was closed from May 1979 until we went online and very few faculty members ever realized that cards were no longer being filed and how completely out-of-date the card catalog had become. According to Library Technology Reports, it is the view of the systems staff at Northwestern University that it will be necessary to provide remote terminals around the campus in order to win the support of their faculty.

Probably one of the most important contributing factors to winning user acceptance is a high level of staff acceptance. Carolyn Murray, who is coordinator of library instruction at the University of Toronto, made a comment concerning the COM catalog that certainly applies to the online catalog as well. She said: "If staff are not convinced that the COM catalog is a positive step forward, their distrust of the new catalog will seriously affect their day-to-day work. In the case of public service librarians, their dissatisfaction will be quickly apparent to the people they are instructing."[7] At Steen Library, staff acceptance has been excellent, but not 100% as we would like. Three of our eleven public service librarians and two of fifteen library assistants stated that they still prefer to use the card catalog. One of the librarians

prefers the card catalog primarily because only a small portion of her collection has been added to the data base (Special Collections), but the other two expressed definite negative feelings toward the whole concept. While this can be expected of a staff as large as ours, it still has an adverse effect on a unified team effort to sell the catalog to users. One of these librarians expressed some of her dislike of the catalog this way: "Many people resist trying the 'little monster' (patrons of all ages). Others want to use it and go no further (end up disappointed)." The other librarian commented: "I have experienced some definite user reluctance in using the machine. Facing that blank screen which is waiting for your subject heading is very different from flipping through the catalog cards--your mind goes blank, you can't think of what to type in, you misspell the word. The card catalog gives you concrete ideas to choose from, while the machine expects you to come up with the words."

On the other hand, 14 of the other 15 librarians and 13 of the library assistants stated that they preferred the online catalog and made many positive statements, although most of them did list features they did not like or features that they would like to see improved, changed, or added. One librarian stated that she preferred neither, but liked both catalogs for different reasons. Samples of positive statements made by librarians are: "I feel I can get more information out of the catalog than with a card catalog, and, while it might be frustrating at times, it certainly is less so than the card catalog." Another commented, "Accessible, latest information, more sophisticated and exciting. I enjoy being in one of the pioneer libraries." And what do you think about this comment? "I guess I'm lazy--I like letting

my fingers do the walking."

Now let's approach the subject of "How to sell the catalog to a user community." I would like to divide my comments into three categories: (1) features of an online catalog that are selling points; (2) techniques that can be used in selling the catalog; and (3) features that need to be added, changed, or addressed in some fashion to enhance user acceptance and make the selling job easier and lasting.

As the online catalog is introduced to users, either through publicity, orientation, or as users are assisted individually at the terminals, much selling can take place if the advantage of the system are pointed out in these encounters. What are the selling features? Most of us at Steen Library believe the following are distinct advantages to the online catalog:

1. It's fast (average turnaround time, under 5 seconds).
2. It's convenient. A person can find all of his information from one physical access point by conducting either author, title, subject, call number, or all four kinds of searches. In contrast, the card catalog or COM catalog requires a person to hunt through separate sections, and with a COM catalog, through supplements. Card catalogs, and often COM catalogs, do not provide call number access.
3. The catalog is accessible at various locations throughout the library. This is a tremendous advantage for us since prior to the online catalog there was no catalog access on the upper three floors.
4. It's up-to-date. From a personal viewpoint, as a former cataloger and now a public service librarian with some

reference duties, this is one of the greatest features of the online catalog. It is great to know that bibliographic information, call number, and location are available to staff and users alike within 24 hours after an item is cataloged. No more backlog of cards waiting to be filed, no more digging for information on an item I might have seen bak in cataloging a few weeks earlier but for which a call number cannot be located--the online catalog is the answer to a librarian's prayer as far as these problems are concerned.

5. It provides status and copy information. I believe this is the feature that pleases most users. They are usually delighted to find out that the system tells them the status--shelf, charged, reserve, etc.--as well as how many copies we own of each title, and the location and status of each copy.

6. If an item is charged, it gives the due-date. Users are also quite pleased to have this feature. It helps them decide whether they wish to have a hold placed on the item.

7. It will help spell and assist in determining subject headings. Being able to truncate words and to browse through author names, titles, and subject headings has proven to be fascinating and of great importance for many of our users. The computer has helped them, as well as library staff, access information which otherwise would have been quite difficult to locate.

8. Simplified filing. It's much easier to teach a user how the computer files than to teach the complexities of ALA filing rules. I feel that the online catalog has solved many filing problems that we experienced with the card catalog. In many ways, J.C. Rather, former chief of LC's Technical Processes Research Office, seemed correct when he described the card catalog as "a place where bibliographic records get lost alphabetically."[8]

9. It's easy on the body--no more hunching over, bending down, or stooping over to use the card catalog. Users can even sit and use the terminals if they are located where chairs and/or stools are provided.

10. It's easy to read. One of our library assistants commented: "It's easier to read the screen than a card--a real boon for near-sighted people. I've used microfiche catalogs too--the print's still small."

11. It's easy to use. Even if a person can't type, they can still use the terminal effectively. "Hunting and pecking" works really well; the truncation and browsing features help. We observe and assist persons regularly who do not type that use the catalog effectively.

If you are trying to sell the concept of an online catalog to your technical services staff, you might also be interested in comments made by two of our technical service librarians as to special features they like about the catalog: "Don't have to alphabetize cards before beginning a search" and "Ease with which records and item information can be added to, deleted from, and corrected or changed in the online catalog.

This is much less time-consuming than with a card catalog."

Techniques for selling an online catalog will, no doubt, vary from library to library. Basically, our efforts can be divided into three categories: (1) publicity, (2) orientation, and (3) printed instructions.

Publicity prior to implementing a catalog is important. Local newspapers, student newspapers, faculty bulletins, and library newsletters all provide excellent means for library publicity and should be used to advertise a new service such as the online catalog. Our decision to go to an online catalog was made so quickly and library staff and users were so busy making plans for the new catalog and/or getting acquainted with the computerized circulation system that the advent of the online catalog crept upon all of us. Little advance publicity was given. Our experience has been, however, that no matter how much or when publicity is given, many persons will not be reached until their initial contact with the terminal.

For example, in an effort to identify the purpose of the terminals, we had stand-up signs made which say PUBLIC ONLINE CATALOG, and attached one of these signs to the top of each terminal. One student commented on the user survey: "First of all, what's an online catalog? I'll bet it's that little computer deal." Another said: "I don't even know what it is!" We wonder how many of our users fall into this category.

Another example was our attempt to formally introduce the faculty as a group to the online catalog. Last April, a rather elaborate program was planned for the faculty. We offered approximately 1½ hour sessions designed as an orientation to the automation programs of the library and

as a means of reorientation to other services, some long-established and some more recent. These sessions included a discussion and demonstration of OCLC, ILL borrowing and lending through OCLC, CRL, online searching service, the automated circulation system, and the online catalog. Extensive publicity was given, and sessions were scheduled throughout a two-day period to allow a convenient time for everyone to attend. Out of approximately 450 faculty members, only 80 attended a session. Even though we were disappointed with the response, we did feel the effort was certainly worthwhile and the comments made by those attending were very positive. Other faculty members who missed the sessions asked for a repat performance, so in November we offered two sessions to all faculty and made a special effort to reach new faculty members. This time only a few persons attended the sessions, most of them new faculty members. I feel our best results in selling the catalog to faculty have been achieved during our day-to-day interaction with individuals as we assist them at the terminals at the point of need.

The continuous introduction and orientation of users to the catalog is handled and/or occurs in several ways. The first is through formal group instruction. Many specialized library orientation sessions for class groups are conducted by the subject librarians. Since we have had the online catalog, introduction to and orientation in the use of the catalog has been incorporated into many of these sessions. In addition, we have a Freshman English orientation program whereby all freshman English classes come to the library for a library orientation session. Included in this is a slide-tape presentation on the library in general. A portion of this show is devoted to the online catalog. Last month,

for the first time, we planned special orientation sessions for graduate students, including orientation to the online catalog. Again much publicity was given the project, but only 40 out of an overall total of 1300 students, took advantage of the sessions. Many area public schools bring classes, particularly junior and senior high school students, to our library to conduct research. When orientation sessions are conducted for these groups, the online catalog is introduced and its use explained and demonstrated. A recent thank-you note received from an area teacher stated: "Thank you for the assistance you gave my English IV Seniors last Monday. The matter-of-fact explanations were excellent for dispelling the mysteries of electronic research. I think my students feel more competent to do research. I know I do."

The second method of orientation, and by and far the largest, is conducted on an individual basis day-by-day as users are assisted in locating material or after a staff member has offered to assist a user who has demonstrated an interest in, or curiosity about, the terminal. Personally, I feel this is the most effective method of orientation if the catalog is presented thoroughly, positively, and competently by the assisting staff member. To have someone available to assist users with the catalog, we have boosted our effort to keep all information desks staffed as much of the time as possible.

A third method is peer instruction. We have also experienced as Murray reported concerning use of the COM catalog at the University of Toronto: "When all is said and done, we ought to point out that every student whom we taught probably returned the favor by teaching at least five peers."[9] It is not uncommon for us to see from four to five students

gathered around a terminal as another demonstrates how to use the catalog.

The fourth method of user orientation is self-instruction. Many of our users are self-oriented through experimentation and practice. The system displays online instructions like this. Information desk attendants try to keep this screen displayed when the terminals are not in use.

Then soon after we went online, we developed instructions that were laminated to the tables near the terminals, with additional copies laminated on both sides and kept in the area for easier use with the terminals. We also used reduced copies for handouts. These were all the printed instructions we used for several months, and a number of users made critical remarks about them on the user survey. One even said "the instructions are terrible" and another commented: "One time I tried to learn to use the online catalog but couldn't understand the instructions or find someone to explain." We have now developed simplified instructions, suggestions, and a location chart that we have laminated to the front of each terminal. These seem to have been well-received by the public and make our job easier as we instruct persons at the terminals.

Because we felt a real need for a more detailed guide for actually accessing information through the online catalog, as well as a need for providing more specific information in use of the terminals, we have just recently produced the brochure "Terminal Tidbits." A copy of this user aid has been given each of you.

Thus we have been and plan to continue our efforts to simplify the instructions, and to produce user aids as needs are identified, to

make it as easy as possible for users to instruct themselves and to use the catalog effectively.

So much for user orientation. Now, let's look at some specific characteristics of online systems--characteristics that will make a system easier to sell. Based on my experience with our online catalog, plus comments made by my colleagues and our users concerning our catalog, I would like to make the following recommendations to those of you who are planning online systems:

1. Data Base. If you are planning an online catalog, start with as large a data base as possible. Due to circumstances beyond our control, we operated for several months with a very small data base because we ran into problems loading OCLC tapes. Our small data base did affect user acceptance adversely and evoked comments from 26 (or over 24%) of those users responding to our user survey. One student made the following comment and even offered a suggestion to solve the problem. He said: "I love the convenience and concept, but I get aggravated when it is incomplete. I think students should with special permission be able to add information to the computer files when they find more information than is in already. How else will the program grow? I know I would take the time to add information that I know is not already in the program." I might add--we didn't follow up on his suggestion--but we do now have over 55,000 records in our data base and hear few complaints concerning this problem.

2. CRTs. Select CRTs with as few extraneous keys as possible. Extra keys that serve no purpose, such as NUMBER and LINE/LOCAL, cause numerous and unnecessary problems for our users.

3. Simple search strategy. Design your system to allow for simple search codes. The DataPhase codes are ideal as far as I am concerned--"A" for author, "T" for title, "S" for subject, and "C" for call number. I believe some existing systems require more elaborate search strategies similar to OCLC's. Another example is the CLSI touch-sensitive system which requires broad alphabetic selection prompted by a touch, to be narrowed down by repeating the touch process until the desired item appears. Evidentally users have experienced some difficulty with this approach, since the library director at Evanston Public Library reported that during their first week of operation the library received many patron requests to post the alphabet somewhere near the online catalog![4] Iowa City Public Library agrees that the CL system is a challenge to the users' spelling and alphabetizing skills.[5]

4. Design the system so that terminals can't be logged off by the public, but rather can only be logged off by staff from a central location. Many of our users accidentally sign themselves off from the computer. Time used in training patrons how to sign on could be spent much more effectively in teaching them how to use the catalog to access material.

5. Design the software so that public terminals serve the single function of catalog searching. The DataPhase System

in use at SFA is designed for multiple functions. Before beginning a catalog search, it is necessary to be in the search or "Inquiry" mode. Many users start their search while the terminal is still prompting them to PLEASE ENTER FUNCTION and end up getting the message THIS FUNCTION INVALID. Training time would be significantly reduced and a great deal of user frustration eliminated if public terminals were single function, catalog search only, and if they couldn't be logged off. One of the librarians described the effect on user acceptance rather aptly: "The number of times I have found terminals logged off, or showing ISBN searches in progress, or with a record of repeated terminal responses of THIS FUNCTION INVALID and so on is mute testimony to some of the frustrations of users." We could not help but be amused at evidence found on a screen recently of a user's apparent frustration. After a display of repeated unsuccessful attempts to PLEASE ENTER FUNCTION, the user had typed in the message "THIS PIECE OF JUNK DON'T FUNCTION."

6. Screen formats. The format should be as simple and straightforward as possible. We are particularly dissatisfied with the serials screen format and are working with DataPhase to have it changed. We would prefer only one screen that could be used for all items regardless of format but would be relieved to have a modified serials screen that would give the call number and holdings on the first screen.

7. System prompts. These should be "user friendly," by which I mean, simple and easily understood. In a user survey conducted by librarian Pritchard at the Library of Congree in 1979, one need echoed by librarians as well as patrons was to keep the language and commands simple and let successive messages on the terminal screen guide the reader through the system.[10] Some of our users have difficulty with "Q" to QUIT and "H" to HALT as well as ESC TO CONTINUE and CHOOSE ONE. They often ask how to get back to where they started or how to clear the machine. Perhaps something like "Q" to BACK UP, "H" to START OVER, ESC TO SEE NEXT SCREEN, or TYPE IN NUMBER OF ITEM SELECTED would be easier for people to understand. Our experience has been, however, that many persons will not read and follow instructions no matter how simple or brief.

8. Design your system so that it will retain or re-display the search terms typed in on an inquiry request. This would make it possible to check for typing or other errors when NO MATCH FOUND displays. Often a search argument has been entered incorrectly, mispelled, or an incorrect subject heading has been used. In the instances when NO MATCH FOUND displays, we would also recommend an additional prompt to the effect to PLEASE CHECK TYPING, SPELLING, SUBJECT HEADING ENTERED, ETC.

9. Response time. Plan your system so that response time will average not more than two seconds. That may sound fast, but it is feasible. Moreover, your user will quickly come to

expect this speed of response time. It is disconcerting to be helping a patron or looking up material for yourself and have to wait for information to appear on the screen or to wait to give your next command while the computer finishes a display in which you are no longer interested.

10. Ability to page forward or backward easily from one display screen to another. To secure a system that minimizes and facilitates paging should receive top priority. The present software for our system is not efficient in this regard. It is essential that this problem be corrected in the near future if we are to continue to have a high level of acceptance. The larger the data base becomes, the more time-consuming and tedious it is to page back through subject displays. This feature of our system is probably the most widely criticized by users and librarians alike.
11. Print capability. While this would raise costs and slow response time when in use, it would no doubt boost user acceptance. Library staff and users both have expressed a desire to be able to push a print button and get a printout of the information they need.
12. Boolean searching would certainly be a selling feature. Choosing a proper subject heading can be a real barrier to locating material whether using the card catalog or online catalog. The ability to search by combining terms would be great! Even greater would be the ability to search by key word, a feature which is now available at the Library of

Congress. While this is not new to abstracting and indexing services, it is a new mode for searching catalogs and would free a user from having to use specific LC names or subjects and could even make information accessible from the notes and series fields.

13. Cross references. Provide as many cross references as possible. Users and staff have expressed a need for additional "see" and "see also" references.

14. Effective backup. Much of the degree of user and staff acceptance hinges upon the assurance that they can be served effectively even when the system is down.

My remarks today have been limited to a great extent by the lack of documentation on existing online catalogs. However, this problem will be addressed soon by the Council on Library Resources. The Council is sponsoring the JMA (J. Matthews & Associates) research project which will begin in June and July to document the impact of the online catalog on libraries and to obtain the reaction to the catalog from a sample of users. A minimum of 800 interviews will be conducted in each of six libraries, both public and academic. The information sought by the patrons, the actions performed by the patron and the results displayed on the terminal will be recorded. In addition, statistics on queuing at the terminals will be collected. We are pleased that Steen Library, along with five other libraries across the nation, having stand-alone public access catalogs, has been selected for the project. In addition to this study, the Council has also awarded grants to OCLC, RLG, and the University of California, Division of Automation, for concurrent studies of

online catalogs. The results of controlled studies of this kind should provide a wealth of material to help in improving existing online catalogs and provide valuable data concerning the online catalog for those libraries that are in the decision and/or planning stages.

There seems to be little doubt but that the future offers many possibilities not available at present with online catalogs. I feel confident that as enhancements and technological advances are made, online systems will continue to become even more sophisticated, but easier to use. I am convinced, however, that no matter how efficient systems become, or how easy they are to use, there will always be the need to orient and instruct users how to use the catalog most effectively to access the information they are seeking. "Selling the catalog" is not a one-time job. It is something that must be addressed in each encounter between the user and the machine. Because of this there will always be the need to work toward winning user acceptance and to work to sell the catalog to a user community. I agree with Rosenthal who stated in an article in the Journal of Library Automation that "there is work cut out for all of us; we need not lament--with sackcloth and ashes--the closing of our card catalogs. Quite the opposite--the future holds for us the exciting promise of a truly opened catalog."[11] I think it is up to us as librarians to convey this message to our users.

NOTES

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2. Noel Savage. "News in Review, 1980." Library Journal. January 15, 1980, p. 116.

3. Richard W. Boss and Deanna B. Marcum. "The Library Catalog: COM and On-Line Options." Library Technology Reports. September/October 1980, pp. 443-527.

4. Susan S. Cherry. "The Moving Finger 'Accesses.'" American Libraries. January 1981, pp. 14-16.

5. "Touch Terminals--'First in Iowa.'" American Libraries. March 1981, pp. 122-23.

6. Linda Arret. "New Catalog/New Librarian? Reference at LC." RQ. Fall 1979, p. 49.

7. Carolyn K. Murray. "Teaching the COM Microcatalogue." RQ. Fall 1979, p. 53.

8. J.C. Rather. "The Future of Card Catalog," a January 18, 1975 program sponsored by the ARL. Washington, D.C.: Association of Research Libraries, 1978, p. 8.

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11. J.A. Rosenthal. "Planning for the Catalogs: A Managerial Perspective." Journal of Library Automation. September 1978, p. 205.

COSTS OF ONLINE LIBRARY CATALOGS

Richard Woods

A pocket computer can be an online catalog for a very small library. A complete system costs less than $350. Records and programs are maintained in the pocket computer's memory and additional memory is provided on a portable cassette tape drive.

Another type of online catalog computer is the bottom of the line microcomputer which uses floppy disks. This could easily be an online catalog for a small library at less than $1,000. File management software costs less than $180.

Stand-alone minicomputer circulation systems with online catalog features start in the $100,000 range. A small consortia of libraries could require over $700,000 to get an online catalog computer system off the ground. A large library network system could have start-up costs of $2,000,000 and operating costs of over $75,000 a month.

Requirements for an Online Catalog

It is difficult to determine which traditional library functions must be automated for a library computer system to qualify as an online catalog. At a bare minimum, the system must have the facilities to batch load machine-readable records and provide online search and retrieval.

Since the online catalog is often considered such an integral part of a library, many diverse cost factors and functional components should be considered in the compilation of actual costs of an online catalog.

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The feasibility of implementing an online catalog can be assessed by relating new program costs to the current budget and increased by seeking opportunities for staggering implementation costs.

The compilation of accurate cost estimates requires the development of a well-defined model of the online catalog. A library should be able to identify a model for analyzing cost by following the steps outlined below:

1. Analyze the environment for an online catalog in the library, among patrons and the administration.
2. Survey the market to identify capable systems.
3. Draft reasonable expectations that meet budget restrictions and market limitations.
4. Develop detailed systems requirements and functional specifications and submit to vendors for price estimates.
5. Consult with similar institutions to assess implementation requirements and costs for staff time and compare to vendor estimates.

Cost Factors of Acquiring and Operating an Online Catalog

Selecting an Online Catalog Computer System

A consultant should be retained in most instances, unless in-house staff have the required expertise. A thorough consulting contract should include editing a library's specifications, assisting in developing a request for proposal, evaluating bids and planning for implementation. A careful examination of vendor descriptions and cost estimates presented by a consultant should be made to ensure all pertinent cost factors are included.

Major Software Components (Functional Capabilities)

Not all of the following functional components will be present in any online catalog system on the market today. However, they are all desirable and should be sought. Each component bears an associated cost factor that will increase overall implementation costs in a manner relative to the complexity and use of the functional components. Long term objectives will play an important role in the process of analyzing each cost factor.

Online catalog: Online access to authority, bibliographic, holdings and locations, circulation, and acquisitions data and search and retrieval capabilities.

Online catalog management: Input and update of catalog information, authority control, machine-readable tape output for backup COM catalog.

Interlibrary request and message switching: For interlibrary lending and information referral.

Online interface to source system for shared cataloging: Important if large data base not maintained on-site, e.g., OCLC interface.

Retrospective conversion: Programmed aids for conversion of manual or machine files.

Teleprocessing interface to local networks: University, governmental, parent institution computer networks, community cable networks.

Public information systems: Calendars, directories, etc.

Base software: Operating system, teleprocessing system, data base management system.

Vendor prices for further software development to meet a library's functional specifications should be itemized in detail as part of the contract or estimated in an attachment.

Major Hardware Components

The quality and quantity of hardware required, and associated prices,

is dependent on a computer system's software design and the way it affects hardware performance and efficiency.

Central processing unit and console: Cost is dependent on efficiency of system operations and performance requirements including size of data base and terminal activity.

Disk drives: Size of data base determines cost.

Tape drives: If needed to input and/or output machine-readable tapes.

Printers: For CRT terminals and the CPU console.

Terminals: Functionally-oriented, color, microcomputers.

Terminal modems and controllers: Needed for leased line and dial-up configurations.

Local telecommunications: Installed and maintained by in-house staff, not Ma Bell.

Backup catalog equipment: If COM catalog, battery-powered equipment might be required.

If the system is planned to have hardware added to it in the future, e.g., terminals and disk drives, costs should be determined ahead of time with attention to inflation, hidden charges, and service fees.

Other One-Time Cost Factors

Data Conversion: Vendor service fees, special supplies.

Documentation: More copies or composition required if vendor supplies too little or inadequate documentation.

Electricity: Wiring for increased load or new outlets, air conditioning, lighting.

Furniture and construction: New online catalog public service area, technical services stations, computer hardware and telecommunications room.

Installation: Fees for installing software, hardware, and telecommunications components.

Staff: Time spent in overall selection and implementation.

Staff conversion: Additional staff required or costs for changing duties of current staff.

Training: Vendor training fees, outside training consultant for areas not covered by vendor, e.g., patron orientation, data base administration, systems analysis, etc.

Recurring Cost Factors

Electricity: For operating hardware, air conditioning, lighting.

Lease or payments for hardware and/or software.

Maintenance: Vendor fees for software and hardware maintenance or other arrangements.

Service center or shared system use charges.

Supplies: Paper, forms, ribbons, COM, magnetic tapes.

Telecommunications: In-house and Ma Bell.

Training: Fees for training new staff, sessions for new system capabilities, refresher courses.

Travel: To network/user meetings, training sessions.

Unplanned obsolesence/new technology: Applies to hardware and software to be realistic.

Computer Facilities Management

Using a Computer Service Center Versus A Locally-Operated Installation

In situations where resource utilization of a parent organization's computer system is at low or no cost to the library, use of a parent organization's service center is probably the only way to go. However, a library system must be found which will operate on that computer and capable data processing staff must be available to maintain the system. The efficiency of system performance is a major cost factor because service center costs are generally dependent on the amount of computer resources utilized by the library system. If the library is a big resource consumer of a service center, it may be difficult to get equal response

for library needs versus dollars spent.

The choice of operating in-house computer facilities or contracting with a service center is impacted by requirements for the number of terminals to be added and size of the data base. A major impact on a data processing service center could require a substantial hardware purchase to support a large terminal network or large data base and cause erratic system performance. The costs may be passed on to the library as lump sum payments as in increased overhead on unit-based charges.

Sharing a System and Operating Costs in a Consortia Versus Running System for One Institution

Sharing a computer system can benefit each institution by reducing the purchase price and operating costs while, at the same time, allowing local control of operations. Other benefits, which also correspond to most network or service center facilities, as opposed to single library installations, are: lowered organizational and facilities overhead, shared catalog data management and enhanced resource sharing systems.

Using Large Network Services

Membership in a large network avoids allocating the lump sum money needed to purchase an online catalog for a single library or a small consortia. Startup costs can be less when system use charges are based on unit consumption of network computer resources and not lump sum fees. Unfortunately, none of the large networks offer reasonably priced online catalog services. The lack of a large network online catalog is largely due to teleprocessing limitations, long distance telecommunications costs, and overload conditions in terminal-affluent systems. As a member of a network, a library could experience high use fees, lack of control over

response time, and other unsatisfactory conditions. This could be complicated further if the network contracts for computer facilities from a service center.

Long Range Needs

Every effort should be made to establish a system that meets long range needs. The inability of a computer system and/or vendor service program to meet long range needs will result in a much greater overall cost to implement and operate an online catalog.

1. Sufficient data processing resources to fully utilize base cost of an online catalog. Patron users of an online catalog need to be able to use the catalog without restraint and without causing overload conditions for the computer system. The system should be capable of responding quickly if patron use of the online catalog exceeds expectations, which are most likely based on use of a card catalog. The overall cost of operating an online catalog system with increasing patron use will rise, however, the cost per unit or transaction should decrease.

2. Incremental or sufficient hardware and software to allow substantial growth for data base, terminal network, and functional capabilities. A vendor's program for upgrading system capabilities must allow for growth and present a detailed schedule of prices. System specifications should include: standardized hardware, widely-used data base management, teleprocessing and operating systems, widely-used programming languages for application software, and independent record and data formats.

The ability to upgrade software and/or hardware can depend on how well the system meets industry and market standards. For example, a de facto industry standard exists for the large number of software and hardware systems designed to be compatible IBM hardware, as opposed to less software and hardware development for systems not compatible with IBM.

3. Interfacing capability. An online catalog computer system should have data formats and system standards that allow for online interactive interfaces to be added to access circulation systems and other systems already operating in the library. Especially important is the capability to interface with shared cataloging and interlibrary lending systems.

4. Warranty and maintenance program for hardware and software. Warranty and maintenance services should be guaranteed beyond the vendor in case the vendor goes out of business or fails to maintain adequate service. In most cases, this warranty would default to the original equipment manufacturer or to an alternate service program of another vendor. If guaranteed long range service cannot be provided, the cost of supplying long range maintenance services by in-house staff should be considered.

Feasibility of Implementing an Online Catalog

Budget Adjustment

A large part of the initial cost of an online catalog will normally come from outside a library's operating budget. However, the feasibility

of operating an online catalog is dependent on transferring the ongoing costs to a library's budget. Online catalog cost factors can be related to cost factors already known for operating a card catalog and other public and technical services that are replaced or enhanced by an online catalog. Use of a data processing service center may require a more substantial onoing budget allotment than an in-house system installation.

Identify service functions that are being replaced such as filing, card production, etc. Emphasize the more efficient use of faculty and parent institution staff time with an online catalog and the limited access without one. Promote the online catalog by looking for good opportunities like organization decentralization plans or potential multi-institution cooperation and programs. Point out improvements such as reorganization of a catalog service area requiring less floor space which can represent a cost reduction for the space occupied by the catalog.

Initial Implementation Cost Reduction

By staggering implementation costs, initial costs can be significantly lower and place the acquisition of an online catalog closer to a library's opportunities to procure funds. Beware of getting locked into a system that meets only initial requirements and budget limitations but cannot be upgraded to meet long range needs.

1. Delay large-scale data conversion to require less hardware and perhaps less software.
2. Require fewer initial functions, if software is available in components.
3. Adapt mode of payment to lease/purchase or other type of financing.

4. Use a service center or network services for initial phases.
5. Build the data base before implementing public access.
6. Seek reduced price opportunities for promotion or test installations.

The Last Online Catalog

Will this online catalog be the last one purchased by the library? What will the next one cost? Library staff and administrators find themselves asking these questions as they discover that systems they to be online catalogs cannot make the grade. Solution: Buy an online catalog for the future.

Purchase a computer system that can be more than just a catalog. The library catalog to stacked materials may soon become just another data file as automated information services continue to develop.

Acquire a system that utilizes technology that will be commonplace in the 1990's. Acquire an online catalog computer system that has the potential to host a wide array of library services not yet conceived. Acquire an online catalog to serve the needs of the information seeker that never wants to set foot in a library.